

REPORT DOCUMENTATION PAGE					<i>Form Approved</i> OMB No. 0704-0188	
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1. REPORT DATE (DD-MM-YYYY) 11/29/2017		2. REPORT TYPE Final			3. DATES COVERED (From - To) 8/1/2015 - 8/31/2017	
4. TITLE AND SUBTITLE A Profiling Float System for the North Arabian Sea				5a. CONTRACT NUMBER N/A		
				5b. GRANT NUMBER N00014-15-1-2903		
				5c. PROGRAM ELEMENT NUMBER N/A		
6. AUTHOR(S) Jayne, Steven R.				5d. PROJECT NUMBER WHOI #132903SP		
				5e. TASK NUMBER N/A		
				5f. WORK UNIT NUMBER N/A		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Woods Hole Oceanographic Institution 266 Woods Hole Road Woods Hole, MA 02543-1536 United States of America					8. PERFORMING ORGANIZATION REPORT NUMBER Final Report	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Theresa Paluszkiwicz Ocean Battlespace Sensing S&T Dept 875 N. Randolph Street Arlington, VA 02210-2109					10. SPONSOR/MONITOR'S ACRONYM(S) ONR	
					11. SPONSOR/MONITOR'S REPORT NUMBER(S) N/A	
12. DISTRIBUTION/AVAILABILITY STATEMENT Unlimited						
13. SUPPLEMENTARY NOTES N/A						
14. ABSTRACT The purpose of this Defense University Research Instrumentation Program grant was to purchase a set of profiling floats to form an upper ocean observing system for the Northern Arabian Sea Circulation – autonomous research (NASCar) Departmental Research Initiative						
15. SUBJECT TERMS Profiling Floats Northern Arabian Sea Upper Ocean Observations						
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON	
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DURIP: A Profiling Float System for the Northern Arabian Sea

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Award Number: N00014-15-1-2903

LONG-TERM GOALS

The purpose of this Defense University Research Instrumentation Program grant was to purchase a set of profiling floats to form an upper ocean observing system for the Northern Arabian Sea Circulation – autonomous research (NASCar) Departmental Research Initiative

OBJECTIVES

The overall goals of the NASCar DRI are to investigate the dynamics and space-time variability of the Somali Current and to improve the forecast of currents by using a combination of remote sensing, autonomous observations and a hierarchy of fine resolution numerical simulations. To achieve these goals the DRI will utilize new observational methods that do not rely on a traditional ship-based observational program. Our contribution to this DRI was to make observations of the upper ocean with autonomous profiling floats.

APPROACH

ALAMO profiling floats were deployed and rapidly profiled the upper 300 meters with gliders flying around them to observe the fast temporal evolution of the upper ocean. Observing the temperature and salinity structure of the upper ocean in the northern Arabian Sea is fundamental to understanding how deep the seasonal monsoon cycle penetrates into the subsurface circulation. The temperature and salinity profiles from the profiling floats are available in near-real time via Iridium satellite phone messaging, and then on to the modeling community via the global telecommunications system (GTS).

TASKS COMPLETED

We purchased 24 Air-Launched Autonomous Micro-Observer (ALAMO) profiling floats from MRV System. The ALAMO floats were equipped with SeaBird CTDs for measuring temperature, salinity and pressure. So far 6 of these floats have been deployed during the ongoing NASCar field program, with the other 18 waiting to be deployed when opportunities arise.

RESULTS

We successfully deployed autonomous profiling floats from several volunteer ships across the Northern Arabian Sea. Using these floats, we observed the fast temporal evolution of the upper ocean salinity and temperature in the North Arabian Sea. Observations so far show interesting temperature and salinity interleaving and structure in the upper ocean. An example result from one of the floats is shown in Figure 1.

IMPACT FOR SCIENCE

These novel observations made of the upper ocean so far show interesting temperature and salinity interleaving and structure in the upper ocean that will be analyzed as part of the NASCar DRI synthesis.

RELATED PROJECTS

Related to this project is our group's work on the international Argo Program, <http://argo.who.edu/>

FIGURES/PICTURES

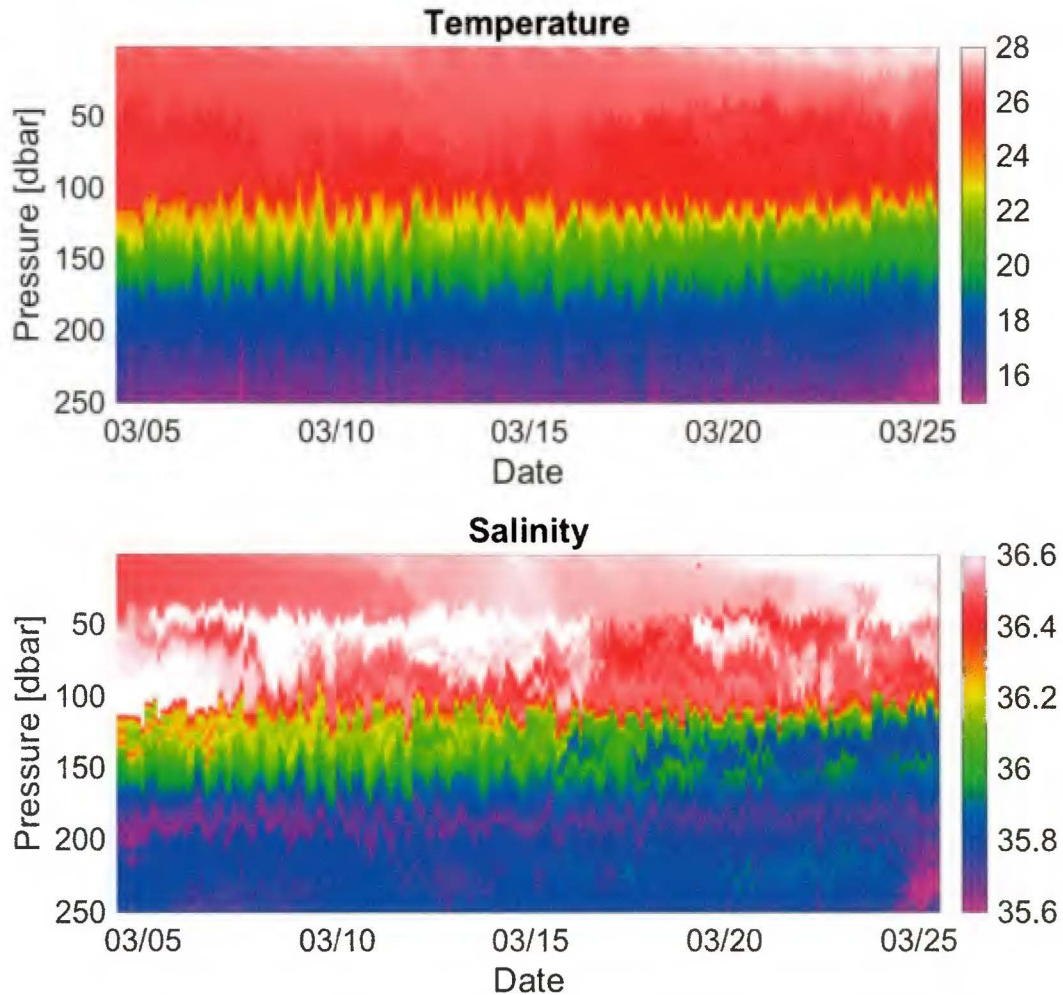


Figure 1 shows the temporal evolution of the upper ocean temperature (upper panel) and salinity (lower panel) from ALAMO float 9103.

REFERENCES

- Centurioni, L. R., V. Hormann, L. D. Talley, I. Arzeno, L. Beal, M. Caruso, P. Conry, R. Echols, H. J. S. Fernando, S. N. Giddings, A. Gordon, H. Graber, R. R. Harcourt, S. R. Jayne, T. G. Jensen, C. M. Lee, P. F. J. Lermusiaux, P. L'Hegaret, A. J. Lucas, A. Mahadevan, J. L. McClean, G. Pawlak, L. Rainville, S. C. Riser, H. Seo, A.Y. Shcherbina, E. Skillingstad, J. Sprintall, B. Subrahmanyam, E. Terrill, R. E. Todd, C. Trott, H. N. Ulloa, and H. Wang, 2017: Northern Arabian Sea Circulation – autonomous research (NASCar): A research initiative based on autonomous sensors, *Oceanography*, **30**(2), 74–87.